

# High Frequency Reflective Mesh for Small Aperture Antennas, Phase I Project

SBIR/STTR Programs | Space Technology Mission Directorate (STMD)



## ABSTRACT

The proposed Phase I program would develop and prototype a high frequency, high performance reflective mesh that is well suited to the emerging small aperture antenna designs. The program will review heritage mesh architectures and trade them against new designs. New materials and manufacturing methods will be evaluated with the goal of making low-cost mesh for CubeSat missions. The mesh samples will be tested to determine their mechanical stiffness properties. RF test samples will be delivered to NASA JPL.

## ANTICIPATED BENEFITS

### To NASA funded missions:

Potential NASA Commercial Applications: NASA commercial applications include any Ka-Band small aperture antennas used for Earth observing science missions (RainCube radar), deep space communications, and any mission needing high data rate downlinks. The mesh technology can be expanded to larger apertures as well for any high gain mission needs.

### To the commercial space industry:

Potential Non-NASA Commercial Applications: There is strong market potential in CubeSat up to smallsat size satellites in the commercial arena. There are numerous communication and data transfer constellations on-orbit and under construction. There are also numerous commercial Earth observation constellations under development. Billions of dollars are being invested in these constellations. Most of these commercial networks are small to nano sized satellites. Many of them would benefit from the lightweight, small packaged volume and high gain antenna performance for either high speed RF communications or weather and ground looking radar. In the terrestrial market, the U.S. Military is actively seeking man-packable high gain antennas for forward operating Warfighters.

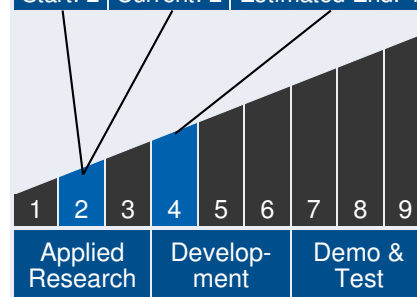


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## Technology Maturity

Start: 2 | Current: 2 | Estimated End: 4



## Management Team

### Program Executives:

- Joseph Grant
- Laguduva Kubendran

### Program Manager:

- Carlos Torrez

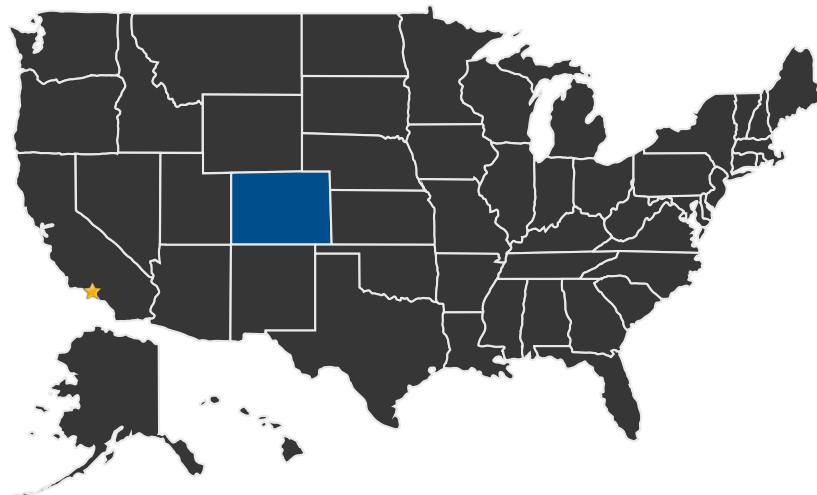
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## U.S. WORK LOCATIONS AND KEY PARTNERS



■ U.S. States  
With Work

★ **Lead Center:**  
Jet Propulsion Laboratory

### Other Organizations Performing Work:

- Tendeg, LLC (Louisville, CO)

## PROJECT LIBRARY

### Presentations

- Briefing Chart
  - (<http://techport.nasa.gov:80/file/23129>)

### Management Team *(cont.)*

#### Principal Investigator:

- Gregg Freebury

### Technology Areas

#### Primary Technology Area:

Science Instruments,  
Observatories, and Sensor  
Systems (TA 8)

- └ Remote Sensing Instruments  
and Sensors (TA 8.1)
  - └ Microwave, Millimeter-,  
and Submillimeter-  
Waves (TA 8.1.4)

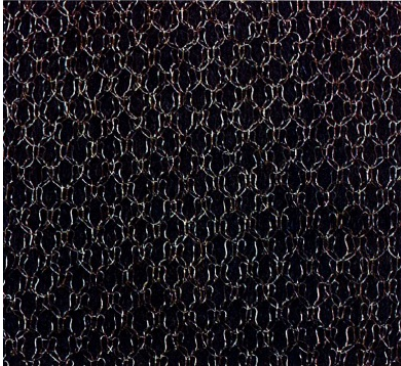
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## IMAGE GALLERY

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*High Frequency Reflective Mesh for  
Small Aperture Antennas, Phase I*

## DETAILS FOR TECHNOLOGY 1

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### Technology Title

High Frequency Reflective Mesh for Small Aperture Antennas, Phase I

### Potential Applications

NASA commercial applications include any Ka-Band small aperture antennas used for Earth observing science missions (RainCube radar), deep space communications, and any mission needing high data rate downlinks. The mesh technology can be expanded to larger apertures as well for any high gain mission needs.